List of To-Do Items

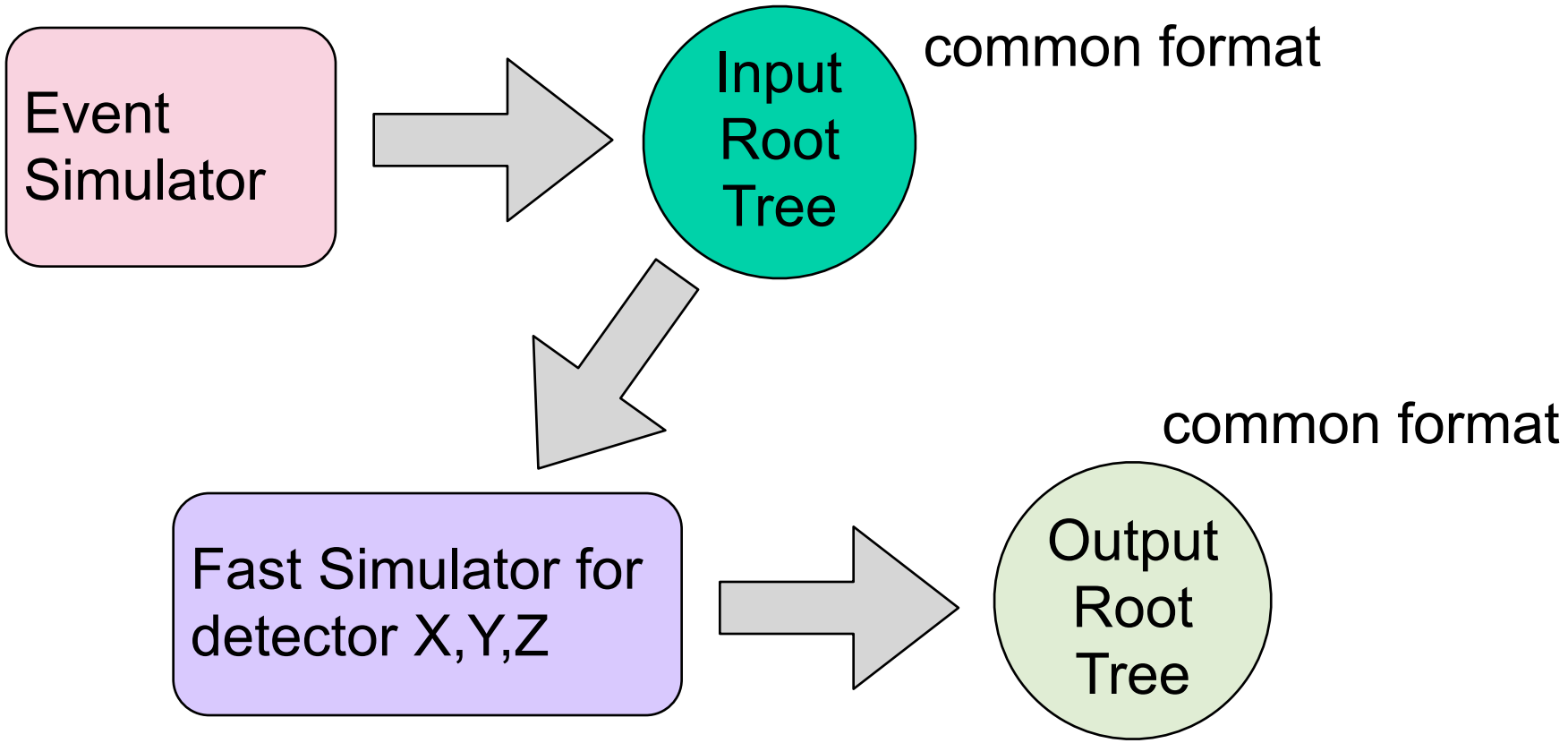
BROOKHAVEN NATIONAL LABORATORY

Detector Simulations (I)

- for EIC-Detector, eSTAR, ePHENIX
  - and any variations that might come to mind
- Cannot afford at this stage a detailed Geant description
  - to rigid, too long turn-around times
- Need a fast simulator/filter that accounts for
  - acceptance as fct of **p**=(px, py, pz, E), theta and phi
  - resolution as fct of **p and theta**
  - PID as fct of **p** and acceptance
- Need a common format and setup to avoid parallel efforts
  - need to be coordinated

Detector Simulations (II)

Suggested Scheme:



Output Root Tree: contains original tree + smeared momenta + accepted/identified or not + *association* between input and output

Detector Simulations (III)

- Input tree can be reused for all possible detector setups
- Analysis & studies on output tree
- Fast simulator should allow easy modification of detector performances
  - level of sophistication will increase over time
  - start with simple version to get going
  - specific fast simulators up to collaborations or task force (i.e. everybody interested in a new detector)
- Need someone to coordinate and maintains this
  - define tree formats (in and out)
  - define interface to fast simulators
  - makes sure all components interface properly

Detector Simulations (IV)

- Needed on the long term: GEANT simulations
  - Start G4 simulations
    - create framework for detector definitions
    - first rough layout of EIC detector
    - include IR (beam line & magnets)

- Evaluate pp, pA, (AA?) capabilities

Physics Topics To Do List (I)

- Jet studies in ep and eA
  - started by G. Soyez but needs to be followed up and extended
  - many questions about how low in E_{jet} one can go
  - p_T imbalance studies -> gluon TMDs
- Di-Hadron correlations
  - similar to above but w/o full jet reconstruction
  - identified as possible key measurement (INT)
- F_L
  - support of Ramiro's effort: add manpower
  - MC (Django) exist for ep & eA & rad. corrections
  - determine resolution and detector requirements

Physics Topics To Do List (II)

- Beauty
  - so far not looked into it at all
  - F_2^b ?
  - fragmentation studies using beauty
  - detector requirements
- Electro-Weak Studies
  - τ ID & detector requirements
  - background: cosmics, QCD background
  - feasible?

To-Do List: Hardware (I)

- Polarimetry
  - hadron polarimetry (p, He^3)
    - need to get below 5%, How?
    - How to measure absolute pol. of He^3
      - is important already for RHIC polarized pHe^3 and He^3He^3
  - electron polarimetry
    - can below ~1% be achieved? (Hera best value = 1.4%)
  - what method Compton backscattering or ? How to increase precision?
  - do we need bunch by bunch polarization measurements

To-Do List (II)

- Luminosity Measurements
  - ep (polarized and not), eA
  - relative L between bunches?
  - what needs to be done?
  - are bremsstrahlung measurements alone enough
  - need high precision here for F_L
  - Hera achieved ~1%

There is more but these are the burning items ...

Need for an Elevator Speech/Tweet

Wikipedia:
An elevator pitch summary used to quickly and simply define a product, service, or organization and its value proposition. The name "elevator pitch" reflects the idea that it should be possible to deliver the summary in the time span of an elevator ride, or approximately thirty seconds to two minutes.

Business, know-how:
An "Elevator Pitch" is a concise, carefully planned, and well-practiced description about your company that your mother should be able to understand in the time it would take to ride up an elevator.

Fermilab Today

Tuesday, Nov. 23, 2010

In Brief

Project X elevator speech contest

Fermilab needs a 60-second elevator speech about the proposed Project X. The speech should represent the many exciting, powerful and rich science programs that would be associated with the project. You can find some of the key scientific programs from recent Project X presentations here.

Please submit an elevator speech in writing to Fermilab's Deputy Director Young-Kee Kim, ykkim@fnal.gov, by Dec. 5. The contest is open to all members of the high-energy physics community and Fermilab employees and users and their family members and friends. Winners will be announced at the second annual potluck party, which will take place on Friday, Dec. 17.

What's on the market

- Raju
  - Investigate with precision the universal dynamics of elusive gluons and "sea quarks" that fundamentally make up nearly all the mass of the visible universe
- Steve
  - EIC = High-Resolution Microscope for Gluon-Dominated Matter
    - Probing the momentum-dependence of gluon densities and the onset of saturation in nucleons and nuclei
    - Mapping the transverse spatial and spin distributions of partons in the gluon-dominated regime
    - Broad Context: Exploring Einstein's ($E=mc^2$) Legacy